

## CLAIMS

What is claimed is:

- 1           1.     A planting assembly comprising:  
2                 a frame, a furrow opening mechanism, a seed tube for directing a seed into a  
3                 furrow, a liquid source, a liquid delivery conduit having a delivery end, and a furrow  
4                 closing mechanism;  
5                 an adapter configured for mounting to the seed tube;  
6                 a spray arm including a proximal end configured for mounting to the adapter, a  
7                 central portion, and a distal end, the central portion extending rearward such that the  
8                 distal end is disposed above the furrow; and  
9                 wherein the liquid delivery conduit is in fluid communication with the liquid  
10                source and the delivery end is adjacent to the distal end.
- 1           2.     The planting assembly of claim 1, wherein the spray arm is configured  
2                 such that the liquid is dispensed from the delivery end downwardly and forwardly  
3                 toward the furrow aft of the seed tube.
- 1           3.     The planting assembly of claim 1, further comprising a spray nozzle  
2                 disposed on the distal end of the spray arm in fluid communication with the delivery  
3                 end.
- 1           4.     The planting assembly of claim 1, wherein the spray arm further  
2                 comprises a deflector shield disposed on the central portion and extending  
3                 downwardly toward the furrow.

1           5.       The planting assembly of claim 1, wherein the spray arm is configured  
2       such that the liquid is dispensed from the delivery end substantially downwardly.

1           6.       The planting assembly of claim 1, further comprising:  
2           a seed positioning device for positioning the seed within the furrow;  
3           a bracket configured for mounting the seed positioning device to the frame, the  
4       bracket being mounted to the frame and the seed positioning device being mounted to  
5       the bracket; and

6                   wherein the proximal end of the spray arm is further configured for  
7       mounting to the bracket.

1           7.       The planting assembly of claim 6, wherein the spray arm is configured  
2       such that the liquid is dispensed downwardly and forwardly into the furrow aft of the  
3       seed positioning device.

1           8.       The planting assembly of claim 1, wherein the liquid is selected from a  
2       group consisting of insecticides, herbicides, fungicides, nematicides, fertilizers,  
3       starters, inoculants, micronutrients, trace minerals, and water.

1           9.       The planting assembly of claim 1, further comprising:  
2           a seed positioning device for positioning the seed within the furrow, the seed  
3       positioning device being mounted to the seed tube; and  
4                   wherein the adapter is further configured for mounting to the seed  
5       positioning device.

1           10. A method of application of a liquid to a furrow with a planting  
2 assembly having a frame, a furrow opening mechanism, a seed tube for directing a  
3 seed into the furrow, a liquid source, a liquid delivery conduit having a delivery end, a  
4 seed positioning device attached to the frame with a bracket, and a furrow closing  
5 mechanism, comprising the steps of:

6           providing a spray arm including a proximal end configured for mounting to  
7 the bracket;

8           forming the furrow with the planting assembly;

9           directing the liquid downwardly into at least a portion of the furrow aft of the  
10 seed tube, thereby applying the liquid to the seed and the furrow; and

11          closing the furrow over the seed.

1           11. The method of application of claim 10, wherein the directing step  
2 further comprises directing the liquid forwardly into the furrow aft of the seed tube.

1           12. The method of claim 10, further comprising the step of positioning the  
2 seed in the furrow prior to applying the liquid.

1           13. The method of claim 10, wherein the liquid is selected from the group  
2 consisting of insecticides, herbicides, fungicides, nematocides, fertilizers, starters,  
3 inoculants, micronutrients, trace minerals, and water.

1           14.     A planting assembly comprising:

2           a frame, a seed guide, a furrow opening mechanism, a seed tube for directing a  
3     seed into a furrow, a liquid source, a liquid delivery conduit having a delivery end, a  
4     seed positioning device connected to the frame with a bracket, and a furrow closing  
5     mechanism;

6           a spray arm including a proximal end configured for mounting to the bracket, a  
7     central portion, and a distal end, the proximal end being mounted to the bracket and  
8     the central portion extending rearward such that the distal end is disposed above the  
9     furrow; and

10          wherein the liquid delivery conduit is in fluid communication with the liquid  
11     source and the delivery end is adjacent to the distal end.

1           15.     The planting assembly of claim 14, wherein the spray arm is  
2     configured such that the liquid is dispensed from the delivery end downwardly toward  
3     the furrow aft of the seed tube.

1           16.     The planting assembly of claim 15, wherein the spray arm is further  
2     configured such that the liquid is dispensed from the delivery end forwardly toward  
3     the furrow aft of the seed tube.

1           17.     The planting assembly of claim 14, further comprising a spray nozzle  
2     disposed on the distal end of the spray arm in fluid communication with the delivery  
3     end.

1           18.    The planting assembly of claim 14, wherein the spray arm is  
2   configured such that the liquid is dispensed from the delivery end substantially  
3   downwardly.

1           19.    A planting assembly comprising:  
2           a frame, a seed guide, a seed tube for directing seeds into a furrow, a liquid  
3   source, and a liquid delivery conduit having a delivery end;  
4           a seed positioning device for positioning the seeds within the furrow;  
5           means for securing the seed positioning device to the frame;  
6           a spray arm including a proximal end and a distal end, the proximal end being  
7   adjacent to the means for securing and the distal end being disposed above the furrow;  
8   and  
9           wherein the liquid delivery conduit is in fluid communication with the liquid  
10   source and the delivery end is adjacent to the distal end.

1           20.    The planting assembly of claim 19, wherein the spray arm is  
2   removably secured to the means for securing.

1           21.     A liquid application device for use with a planting assembly having a  
2     frame, a furrow opening mechanism, a seed tube for directing a seed into a furrow, a  
3     liquid source, a seed positioning device for positioning a seed within a furrow, a  
4     bracket for connecting the seed positioning device to the frame, a liquid delivery  
5     conduit having a delivery end, and a furrow closing mechanism, the device  
6     comprising:

7           a spray arm including a proximal end configured for mounting to the bracket, a  
8     central portion, and a distal end, the central portion extending rearward such that the  
9     distal end is disposed above the furrow; and

10          wherein the liquid delivery conduit is in fluid communication with the liquid  
11     source and the delivery end is adjacent to the distal end.

1           22.     The liquid application device of claim 21, further comprising an  
2     adapter having a first side configured for mounting to the seed tube and a second side  
3     configured to removably receive the proximal end of the spray arm.

1           23.     The liquid application device of claim 22, further comprising:

2           a hook portion and an extension defining a locking aperture extending from  
3     the second side of the adapter;

4           a locking tab and a J-shaped extension disposed on the proximal end of the  
5     spray arm, the J-shaped portion configured to engage the adapter and the locking tab  
6     configured to removably engage the locking aperture; and

7           wherein the J-shaped portion is received within the hook portion and the  
8     locking tab is removably received within the locking aperture, thereby removably  
9     securing the spray arm to the adapter.

1           24.     A liquid application device for use with a planting assembly having a  
2     frame, a furrow opening mechanism, a seed tube for directing a seed into a furrow, a  
3     liquid source, a liquid delivery conduit having a delivery end, and a furrow closing  
4     mechanism, the device comprising:

5           a spray arm including a proximal end configured for mounting to the planting  
6     assembly, a central portion, and a distal end, the central portion extending rearward  
7     such that the distal end is disposed above the furrow;

8           a spray head configured to be telescopically received on the distal end of the  
9     spray arm; and

10          wherein the liquid delivery conduit is in fluid communication with the liquid  
11     source and the delivery end is adjacent to the distal end.

1           25.     The liquid application device of claim 24, further comprising:

2           a plurality of projections disposed on opposing sides of the distal end of the  
3     spray head; and

4           a plurality of slots formed in the spray head, the plurality of slots being  
5     configured to receive at least one of the plurality of projections, so that the spray head  
6     is removably secured to the spray arm.

1           26.     The liquid application device of claim 24, wherein the distal end of the  
2     spray arm is threadably secured to the spray head.

1           27.     The liquid application device of claim 24, further comprising:  
2           a plurality of apertures formed in the distal end of the spray arm;  
3           at least a pair of corresponding apertures formed in the spray head, the pair of  
4           corresponding apertures spaced such that each of the pair of corresponding apertures  
5           aligns with a respective aperture on the spray arm simultaneously; and  
6           securing means configured to pass through the aligned apertures and  
7           corresponding apertures, thereby removably securing the spray head to the spray arm.

1           28.     A liquid application device for use with a planting assembly having a  
2           frame including a mounting hole, a furrow opening mechanism, a seed tube for  
3           directing a seed into a furrow, a liquid source, a liquid delivery conduit have a  
4           delivery end, and a furrow closing mechanism, the device comprising:

5           a spray plug including a proximal end configured for urging through the  
6           mounting hole, a distal end, a central portion disposed therebetween and including a  
7           fluid passage in fluid communication with the distal and proximal ends; and

8           wherein the liquid delivery conduit is in fluid communication with the liquid  
9           source and the delivery end is in fluid communication with the proximal end.

1           29.     The liquid application device of claim 28, further comprising a lip  
2           disposed on the proximal end of the spray plug, the lip being configured to engage the  
3           frame after being urged through the mounting hole, thereby securing the spray plug in  
4           the frame.

1           30.    The liquid application device of claim 29, further comprising a  
2    plurality of fingers disposed on the distal end of the spray head, the fingers being  
3    configured to engage the frame, thereby preventing rotation of the spray plug in the  
4    mounting hole.

1           31.    The liquid application device of claim 29, further comprising a  
2    plurality of mounting tabs disposed around the periphery of the spray plug, each  
3    mounting tab including a portion of the lip and being configured to be urged inwardly  
4    toward a longitudinal axis of the spray plug.